BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Biomedical Science Pearson BTEC International Level 3 Diploma in Environmental Science Pearson BTEC International Level 3 Extended Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Environmental Science
Unit number and title	**Unit 25: Water Quality**
Learning aim(s)	**B:** Understand how biological, chemical and physical factors influence water quality and aquatic species
Assignment title	**Biological, chemical and physical factors and their influence on water quality and aquatic species**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are a laboratory technician working in an analytical laboratory for a local water supply company and in this role, you have learnt that global warming and the quality of water has been highlighted and reported about consistently in the media in recent times. Good quality water is essential for life on earth. There are many factors which affect the quality of water and aquatic species that live in water for most of the time. These factors can be classified as physical, biological and chemical. You and other scientists and technicians working in any of these sectors and habitats need a good understanding of how for example water quality is affected by dissolved substances in water, pollutants contaminating water, acidification and eutrophication. There is a young person from a local academy visiting your department for a week and you have been asked by your supervisor to produce a portfolio that this visitor may have to help them understand the work of the department and the wider implications of managing water quality.

Task	To build your portfolio you must **Evaluate** how the life cycle of two aquatic species can be affected by physical, biological and chemical factors. **Discuss** acidification and eutrophication in aquatic habitats. **Discuss** changes in water quality of a river. **Compare** the differences in content of marine and fresh water with drinking water. **Explain** the presence the presence and impact of substances and microorganisms in water sources. Your portfolio will be in the following 3 sections: Section 1 – What's in Water? • **Compare** the differences in dissolved substances and

	microorganisms found in marine water (oceans and seas), fresh water (rivers) and water that has been treated for human activities (drinking and washing), by carrying out secondary research. You could look at the information labels listing the contents of a range of bottled water products. Identify a variety of substances that are dissolved and what makes them suitable to sustain life processes. Remember to explain the similarities and difference. • For at least three examples of each of (a comprehensive range of at least 9 examples in total): o Biological pollutants o Organic chemical materials o Inorganic chemical materials **Explain** the presence and impact of these substances and microorganisms in water sources. Identify if their presence is due to natural factors, human activity or both. Explain how the substances and microorganisms are introduced to the water and include the effects of the substance or microorganism on the water, aquatic life and humans. • **Discuss** the changes in the quality of water for a selected river as it travels from its source to its mouth through different physical environments and combines with other rivers or sources of water. Consider natural processes and human activities that would influence the content of the water and the effect on aquatic life present. Section 2 - Damage to aquatic habitats • **Discuss** the processes of acidification and eutrophication and explain how these processes occur naturally. Refer to the carbon and nitrogen cycles, how the effect of human activity increases the rate of both processes, and how each process can impact on the other. Explain the effect on aquatic habitats and how the processes could be managed to restore the original habitat. Section 3 – The life cycle of aquatic animals and plants • **Evaluate** how the life cycle of two named aquatic animal or plant species from different aquatic environments can be affected by physical, biological and chemical factors. Include factors which will promote or decrease their life cycle and their population. Evaluate the wider impact on the ecosystem if the species was present or absent, what measures need to be taken to restore the balance. Case studies such as the use of the pesticide DDT, mercury poisoning, or nitrogenous fertilisers would provide suitable starting points for your evaluation.
Checklist of	A research report that includes:

evidence required	• An explanation of the presence and impact of substances and microorganisms in water sources • A comparison of the differences in dissolved substances and microorganisms • A discussion about the changes in water quality for a selected river from source to mouth • A discussion about the processes of acidification and eutrophication in aquatic habitats • An evaluation of how the life cycle of two named aquatic animal or plant species from different aquatic environments.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
B.D2	Evaluate how biological, chemical and physical factors affect the life cycle of two named species of aquatic animal or plant life.
B.M4	Discuss acidification and eutrophication in aquatic habitats.
B.M3	Discuss changes in water quality of a selected river as it travels from source to mouth.
B.P4	Compare differences in the content of marine and fresh water with drinking water.
B.P3	Explain the presence and impact of substances and microorganisms in water sources.
Sources of information to support you with this Assignment	All sources of information suggested are UK based. Centres are free to amend these sources to those available in the Country of delivery where more appropriate. www.edu.rsc.org.uk – Pollutant detection and remediation; What are the dissolved solids in sea water; Does tap water and sea water contain dissolved solids or gases; Water! Water! www.STEM.org.uk - Water pollution; Biochemistry of pollution; Evolution and pollution; The other CO2 problem. Investigations into Eutrophication www.nasa.gov – What is ocean acidification; Climate change Seeps into the Sea www.nationalgeographic.org – Dead zone; The Acid Sea; Ocean Acidification facts and information; Water pollution facts and information; Deforestation facts and

	information; Within the copyright laws learners could search YouTube for:– Ocean acidification; Ocean acidification in a nutshell; Eutrophication explained; Marine pollution; Types of pollutants that affect water quality; The basics of water quality.
Notes to the Assessor and technician	Practical work may be undertaken when teaching learners the unit content in preparation for this assignment, but is not required to complete the assignment itself. Before doing any practical activity, you should always carry out your own risk assessment and refer to the necessary regulations. In particular, any local rules issued by your employer must be obeyed, regardless of what is suggested here. Centre should use Health and Safety information provided by a reputable source. In the UK such an example organization is CLEAPSS http://science.cleapss.org.uk/